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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,071	08/01/2003	Thomas J. McIntyre	BA-00590 (1763-13-3)	6330
996	7590	08/25/2006	EXAMINER	
GRAYBEAL, JACKSON, HALEY LLP 155 - 108TH AVENUE NE SUITE 350 BELLEVUE, WA 98004-5901			LEPISTO, RYAN A	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/633,071

Applicant(s)

MCLNTYRE ET AL

Examiner

Ryan Lepisto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-14 is/are allowed.
- 6) ☒ Claim(s) 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Please update your records with the correct serial number for applicant's application which is 10/633,071 not 10/663,071. The responses sent on 3/3/06 and 7/10/06 were delayed getting to the examiner because of the wrong serial number on the responses.

### ***Claim Objections***

**Claims 3, 5-6 and 9** are objected to because of the following informalities: Each of these claims have instances of "the cladding layer" that should be amended to read – the first cladding layer –. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 15** is rejected under 35 U.S.C. 102(b) as being anticipated by **Nashimoto (US 2001/0026669 A1)**. Nashimoto teaches an integrated circuit structure (Figs. 1A, 9) and method of forming such (Figs. 8A-H and 11A-H) comprising a substrate (1), an optical transmission layer (3, 3A) formed over the substrate, a first cladding layer (6Aa+6Ab, 6A) formed on the transmission layer (3, 3A) and mesa structures (6Ba, 6B, 6C) formed on the cladding (6Aa+6Ab, 6A) wherein the cladding and mesas have

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portions removed to form angle sidewalls in the cladding layer (paragraphs 0073, 0074, 0086).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nashimoto as applied to claim 15 above, and further in view of **Fournier et al (US 5,210,801)** (Fournier).

Nashimoto teaches the device previously discussed.

Nashimoto does not teach expressly a silicon oxynitride transmission layer and silicon dioxide cladding. Nashimoto does teach that a critical part of waveguide is that the refractive index difference between transmission layer and cladding is less than 0.05 (paragraph 0040)

Fournier teaches a planar waveguide structure using a silicon oxynitride transmission layer and a silicon dioxide cladding wherein the refractive index of the cladding is 1.46 while the refractive index of the transmission layer can be adjusted in the range of 1.45 to 2 (column 5 lines 41-46).

Nashimoto and Fournier are analogous art because they are from the same field of endeavor, planar waveguides.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the materials taught by Fournier in the waveguide taught by Nashimoto since these materials can be adjusted to meet the refractive index criteria of Nashimoto.

Nashimoto does not teach expressly a lower limit of the sidewall angle being five degrees. According to applicant's specification, the critical angle of the sidewall is less than a critical angle to ensure total internal reflection (page 7 lines 18-19). No lower limit is defined in the specification and therefore a lower limit cannot be critical to the invention.

At the time the invention was made, it would obvious to a person of ordinary skill in the art to select any angle less than an angle to ensure total internal reflection like less than 50 degrees as is shown in the drawings of Nashimoto. Applicant has not disclosed that a lower limit of five degrees provides an advantage, is used for a particular purpose, or solves a stated problem and therefore lacks criticality.

The motivation for doing so would have been reduce wavelength sensitivity by using material with high refractive index variations (Fournier, column 5 lines 65-68).

### ***Allowable Subject Matter***

**Claims 2-14** are allowed.

With regard to claims 5 and 10: These claims are allowable over the prior art of record because the latter, either alone or in combination, does not disclose nor render obvious a method of optically interconnecting layers in an optical integrated circuit

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including a substrate by forming a first optical transmission layer over the substrate, forming a first cladding layer on the first optical transmission layer, removing portions of the first cladding layer to form an angled sidewall in the first cladding layer by forming mesa structures at desired locations and removing the mesa structures and portions of the cladding and forming an optical interconnect layer on the angled sidewall of the first cladding layer and on an exposed portion of the first optical transmission layer or forming a second cladding on the first interconnect layer and forming a sidewall in the same fashion or a method of optically interconnecting layers in an optical integrated circuit including a substrate by forming a first optical transmission layer over the substrate, forming a first cladding layer on the first optical transmission layer, removing portions of the first cladding layer to form an angled sidewall in the first cladding layer and forming an optical interconnect layer on the angled sidewall of the first cladding layer and on an exposed portion of the first optical transmission layer or by removing portions of the first transmission layer and forming a first dielectric layer in the void, removing portions of the first dielectric layer to planarize upper surfaces of the layer in the void regions and forming a first cladding layer on the planarized surface, forming mesa structures on the first cladding, removing the mesa structure to form the angled sidewall and forming a second optical transmission layer on the angled sidewall, in combination with the rest of the claimed limitations.

With regard to claims 2-4, 6-9 and 11-14: These claims are allowable over the prior art of record because they depend on allowable claims.

### ***Response to Arguments***

Applicant's arguments filed 10 July 2005 have been fully considered but they are not persuasive. The applicant argues that claim 15 includes structure that is allowable for the same reasons as claims 5 and 10. Methods and products are allowable different reasons. Products depend on the structural limitations even if they have method steps recited (product-by-process).

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted)

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979).

The reasons for allowance in the action 07 April 2006 indicated the method steps allowable for the reasons stated "in combination with the rest of the claimed limitations" (see page 9 of the action). This means that the combination of the limitations in these claims is allowable and not one specific limitation. Further since these claims are

method claims, even if the entire method step was recited in the product claim, the product claim would not be necessarily be allowable since only the structural limitations that result from the method are considered. In no way did the examiner state that the amended portion in claim 15 would result in this claim be allowable.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-Th 7:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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Date: 8/10/06



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